

(12) INTERNATIONAL PUBLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
31 December 2003 (31.12.2003)

PCT

(10) International Publication Number
WO 2004/001057 A1

- (51) International Patent Classification⁷: C12P 23/00, C12N 9/10
- (21) International Application Number: PCT/EP2003/003742
- (22) International Filing Date: 10 April 2003 (10.04.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 02013784.0 21 June 2002 (21.06.2002) EP
- (71) Applicant (for all designated States except US): DSM IP ASSETS B.V. [NL/NL]; Het Overloon 1, NL-6411 TE Heerlen (NL).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): HOSHINO, Tatsuo [JP/JP]; 2-18-14 Fueta, Kamakura-shi, Kanagawa-ken, Kanagawa 248-0027 (JP). MASUDA, Setsuko [JP/JP]; Kuritaya 5, Kanagawa-ku, Yokohama-shi, Kanagawa-ken, Kanagawa 221-0804 (JP). SETOBUCHI, Yutaka [JP/JP]; 4-27-2 Kataseyama, Fujisawa-shi, Kanagawa-ken, Kanagawa 251-0033 (JP).
- (74) Agents: TEIPEL, Stephan et al.; Lederer & Keller, Prinzregentenstrasse 16, 80538 München (DE).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: PROCESS FOR PRODUCING CAROTENOIDS

(57) Abstract: The present invention relates to a biological process for producing carotenoids utilizing a microorganism which is capable of producing carotenoids and belonging to the genus Xanthophyllomyces (Phaffia) in the presence of an inhibitor for biosynthesis of sterols from farnesyl pyrophosphate.

WO 2004/001057 A1

INTERNATIONAL SEARCH REPORT

International Application No

EP 03/03742

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C12P23/00 C12N9/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12P C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96 09393 A (REYNOLDS TECHNOLOGIES INC ; BIOSOURCE TECH INC (US); HANLEY KATHLEE) 28 March 1996 (1996-03-28) page 1, line 16 - line 21 page 2, line 20 - line 25 page 7, line 3 - line 31	1-12
X	DATABASE WPI Section Ch, Week 200346 Derwent Publications Ltd., London, GB; Class D16, AN 2003-485780 XP002250540 & JP 2002 300896 A (TOYOTA JIDOSHA KK), 15 October 2002 (2002-10-15) the whole document	1-12

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

7 August 2003

Date of mailing of the international search report

22/08/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Smalt, R

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/EP 03/03742

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>BROWN G R ET AL: "Phenoxypropylamines: a new series of squalene synthase inhibitors." JOURNAL OF MEDICINAL CHEMISTRY. UNITED STATES 13 OCT 1995, vol. 38, no. 21, 13 October 1995 (1995-10-13), pages 4157-4160, XP002250539 ISSN: 0022-2623 cited in the application the whole document</p> <p>----</p>	
A	<p>WO 00 01650 A (DCV INC) 13 January 2000 (2000-01-13) page 11, line 20 - line 24 page 12, line 18 - line 21 page 22, line 2 - line 10 page 25, line 24 - line 27 page 33, line 9 - line 11</p> <p>----</p>	
A	<p>ROBINSON G W ET AL: "CONSERVATION BETWEEN HUMAN AND FUNGAL SQUALENE SYNTHETASES: SIMILATITIES IN STRUCTURE, FUNCTION, AND REGULATION" MOLECULAR AND CELLULAR BIOLOGY, WASHINGTON, DC, US, vol. 13, no. 5, 1 May 1993 (1993-05-01), pages 2706-2717, XP000604626 ISSN: 0270-7306 abstract page 2706, right-hand column, paragraph 2</p> <p>----</p>	
A	<p>US 5 182 208 A (JOHNSON ERIC A ET AL) 26 January 1993 (1993-01-26) cited in the application column 7, line 5 - line 8</p> <p>-----</p>	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

P 03/03742

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9609393	A	28-03-1996	US 5741898 A AU 3546595 A WO 9609393 A1	21-04-1998 09-04-1996 28-03-1996
JP 2002300896	A	15-10-2002	NONE	
WO 0001650	A	13-01-2000	AU 4863099 A CA 2331343 A1 CN 1330621 T EP 1095002 A1 JP 2002519049 T WO 0001650 A1 US 6410755 B1 US 2003125573 A1 US 6531303 B1 US 2003092144 A1	24-01-2000 13-01-2000 09-01-2002 02-05-2001 02-07-2002 13-01-2000 25-06-2002 03-07-2003 11-03-2003 15-05-2003
US 5182208	A	26-01-1993	US 5356809 A AT 147784 T CA 1335884 C DE 68927676 D1 DE 68927676 T2 DK 11694 A DK 86590 A EP 0436562 A1 FI 103732 B1 JP 2880545 B2 JP 4501053 T NO 901586 A WO 9001552 A1 AU 653916 B2 AU 5538590 A KR 191671 B1 NZ 232366 A WO 9102060 A1	18-10-1994 15-02-1997 13-06-1995 27-02-1997 24-07-1997 27-01-1994 06-04-1990 17-07-1991 31-08-1999 12-04-1999 27-02-1992 06-04-1990 22-02-1990 20-10-1994 11-03-1991 15-06-1999 27-08-1991 21-02-1991